

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

May 16, 2005

TO: Internal File

THRU: Pamela Grubaugh-Littig, Permit Supervisor

THRU: Dana Dean and Wayne Western, Co-leads

FROM: James D. Smith, Environmental Scientist

RE: Lila Canyon Extension, UtahAmerican Energy, Inc., Horse Canyon Mine,
C/007/0013, Task ID #2159

SUMMARY:

Permittee's Action		DOGM's Action	
Original submittal	02/11/2002	Designated as PM02B (Task # 23)	
		Determined Administratively Complete	02/25/2002
Published	Feb – Mar 2002		
		TA (“informal”)	03/26/2002
		Informal Conference	04/21/2002
Response to TA	04/24/2002	Designated as PM02B-1 (Task # 1411)	
		Tech Memo – Hydrology	07/29/2002
		TA	07/19/2002
Response to TA	12/06/2002	Designated as PM02B-2 (Task # 1348)	
		Tech Memo – Hydrology	03/31/2003
		TA	04/08/2003
Response to TA	02/24/2004	Designated as Task # 1859	
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		Tech Memo – Hydrology	06/11/2004
		TA	06/15/2004
Response to TA	02/25/2005	Designated as Task # 2159	
		Tech Memo – Hydrology	05/13/2005

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The Lila Canyon Extension Permit Application Package (MRP) has been submitted and reviewed as an extension to the existing Horse Canyon Mine Mining and Reclamation Plan (MRP). The current Horse Canyon Mine permit area contains approximately 1,330 acres, and the Lila Canyon extension contains approximately 4,700 acres for a total of 6,030 acres.

UtahAmerican Energy, Inc. (the Permittee) has proposed to develop new surface facilities near the mouth of Lila Canyon in order to mine coal in six federal leases. The federal leases are contained within the "North Block Logical Mining Unit" as approved by the United States Bureau of Land Management (BLM) January 1, 1994.

The current Horse Canyon Mine disturbed area is about 74 acres. All but 16.18 acres of that acreage is in Phase 3 reclamation. On February 25, 2004 the Division gave final approval to a change in post-mining land use on the unreclaimed 16.18 acres plus some undisturbed acreage: the land and structures, including the Horse Canyon Well, are to be donated by the Permittee to the College of Eastern Utah (CEU) for use as a science field camp for Utah universities. As stated in a verification letter dated February 6, 2004, if the transfer has not occurred at the time of the Permittee's application for final bond release, the Division will need to determine if there is reasonable likelihood this alternative post-mining land use will be accomplished; if the Division determines the transfer will not be made, the post-mining land use will revert to wildlife and grazing and the requirements of final reclamation will need to be met.

The Lila Canyon Extension Permit Application is a Significant Permit Revision, so publication of a notice for public comment was required. Because of the long time period between the Division's April 2003 TA and the Permittee's February 2004 response, the Division considered the permit application to be inactive and required the applicant to publish again.

The Southern Utah Wilderness Alliance (SUWA) identified a number of issues during the Informal Conference held on April 21, 2002. The Permittee did not attempt to address those issues in the April 24, 2002 submittal. The Division's July 2002 TA included comments on SUWA's concerns, and the Findings sections identified some additional information needed in consideration of some of SUWA's concerns. On March 3, 2005, the Permittee submitted a letter specifically addressing SUWA's comments.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

PERMIT APPLICATION FORMAT AND CONTENTS

Analysis:

The name on the submitted amendment is Horse Canyon Mine – Part B – Lila Canyon Mine. The proposed Lila Canyon Mine is also referred to as the Lila Canyon Extension of the Horse Canyon Mine, or simply the Lila Canyon Extension or Lila Extension.

The Lila Canyon Mine amendment is an extension to an existing permit. Although the Lila Canyon Mine amendment is largely formatted as a stand-alone document, there are baseline data and other information in the current Horse Canyon Mine MRP that are relevant to the Lila Canyon Extension. There are two separate water-monitoring plans, one for the Lila Canyon Extension and another for the Horse Canyon Mine. There is a PHC for the Horse Canyon Mine and another in the Lila Canyon Extension, which utilizes data from the Horse Canyon Mine.

The old surface facilities in Horse Canyon will not be used for mining in the Lila Extension. Part of the disturbed area at the Horse Canyon Mine has been reclaimed and has received Phase II bond release. On February 25, 2004, the Division approved a change in post-mining land use on the remaining disturbed area that has not been reclaimed (16.18 acres): the land and structures are to be donated by the Permittee to the CEU for use as a science field camp for Utah universities. This change in use is supported by the University of Utah's Center for Mine Land Redevelopment and the Emery County Board of Commissioners. The change to the MRP has been approved but the transfer to CEU has not occurred (as of April 2005). If the transfer has not occurred at the time of the Permittee's application for final bond release, the Division will need to determine if there is reasonable likelihood this alternative post-mining land use will be accomplished; if the Division determines the transfer will not be made, the requirements of final reclamation will need to be met.

Assuming approval of the Lila Canyon amendment and eventual bond release at Horse Canyon Mine, the Lila Canyon amendment will eventually become the bulk of the MRP. It would make the permit more usable now if the Horse Canyon and Lila Canyon parts were unified, eliminating the need to refer to a separate Lila Canyon and Horse Canyon Mine binders.

There were previously two figures named Figure 7-1, one in Volume 6 and another in Volume 7. The Figure 7-1 in Volume 6 was followed by an unnamed figure. The Figure 7-1 in Volume 7 was at the end of Chapter 8 and easily overlooked. The Permittee has renamed these figures and placed all three at the end of Chapter 7. They are listed in the Table of contents for Chapter 7.

Findings:

Permit Application format and Contents are adequate to meet the requirements of the Coal Mining Rules.

ENVIRONMENTAL RESOURCE INFORMATION

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Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Baseline Information

Ground-water Information

Fluid levels were reported in a number of boreholes by Kaiser. Drill holes S-26, S-27, S-28, and S-31 were cased in 3-inch PVC pipe with bottom perforations for water monitoring; however, cement seals were faulty, allowing the PVC pipe to fill with cement. Drill hole S-26 was reported dry the week prior to cementing. Reports by Kaiser stated that, with the exception of drill hole S-32, subsurface water was not detected in holes drilled (using air, mist and foam) within 1.25 miles of the cliff face. No apparent increase in fluid level could be attributed to ground-water inflow from these holes, some of which were open for two weeks (Section 724.100, Wells). Fluid initially reported in some boreholes might have been drilling fluid rather than ground water.

S-32 was drilled in 1981 in SE1/4SW1/4 Sec. 6, T. 17 S., R. 15 E., south of the Lila Canyon Extension, and completed as a piezometer from the lower Grassy Member down to the upper Sunnyside Sandstone of the Blackhawk Formation (driller's log in Appendix 6-1). Appendix 6-1 also includes a Chronology of Development, Water Pump Tests and Samples, a series of water level measurements, and one suite of water-quality analyses. The Permittee located S-32 in 2002 and attempted to measure water levels, but found this piezometer unusable (Section 724.100).

IPA-1, IPA-2, and IPA-3 were drilled in 1993 and completed as piezometers in 1994. Water levels were measured from 1994 through 1996, and the Permittee resumed measurements in 2000 (Section 724.100).

In 1980, Kaiser Steel unsuccessfully attempted to convert exploratory boreholes S-26, S-28, and S-31, located south of the Williams Draw Fault, to ground-water observation wells or piezometers. Offsetting shallow piezometers were then bored. A-28, the offset to S-28, also was unsuccessful (Table VI-3). A-26 and A-31 were developed to observe ground water in the alluvium of Little Park Wash. Table VI-3 does not indicate that A-26 and A-31 have been plugged and abandoned; however, the Permittee has no data on them and considers them unusable for ground-water monitoring (Section 724.100).

Two borings described as wells are located in the alluvium of lower Horse Canyon. The one identified as the MDC Well has - to the best of the Permittee's knowledge - been sealed (Section 724.100). The Horse Canyon Well is located nearer the old Horse Canyon Mine surface facilities (Plate 7-1). The location of water right 91-185 in the nw/4 of Sec 9 (Table 7-2) matches the location of the MDC Well, but this water right has probably been used for the Horse Canyon Well also.

The Horse Canyon Well, located near the main Horse Canyon surface facilities, is open, although not operational. The condition of this well is briefly described in the supplemental information accompanying the December 6, 2002 submittal (there is a non-working pump on top of a concrete cap that encloses the well, and there is no direct access to the water). The Permittee states this well will be refurbished and used during the mining and reclamation activities then sealed and plugged (724.100 Ground Water Information, Wells). The MRP contains no information on the water quality or quantity.

As part of the post-mining land use change approved by the Division on January 6, 2004, the Horse Canyon Well is to be transferred to CEU as a potential source of culinary water for the Utah universities science field camp. According to R645-301-731.400, the permittee retains responsibility for proper management of this well until bond release. If the Horse Canyon well is transferred to CEU, the Permittee will no longer be involved in maintenance or operation; however, if the well becomes operational while included in the permit, the Division will require the Permittee to provide information on water quality and quantity. If the transfer to CEU has not occurred at the time of the Permittee's application for final bond release, the Division will need to determine if there is reasonable likelihood this alternative post-mining land use will be accomplished. If the Division determines the transfer will not be made, the requirements of final reclamation will need to be met. Because the transfer to CEU has not occurred and may not occur, the MRP discusses the well as though it will remain part of the Horse Canyon Mine and be subject to final reclamation, which will include sealing of this well. This possible future transfer to CEU is not discussed in the submittal, and Section 741.300 states, "There are presently no plans to transfer any wells to any other party."

The Division received comments that extrapolation of the potentiometric surface on Plate 7-1 ignored faults, ignored the car dump, ignores the most recent data, and covers an unacceptably large area based on just three closely spaced data points. The Division notes that the potentiometric surface also does not extend to the 1993 BXG measurement in the Horse Canyon Mine (which is, however, closely congruent with the surface as drawn). In spite of these limitations, the potentiometric surface and the projected water-coal contact on Plate 7-1 provide a reasonable approximation of the depth to water in the coal seam and in water-bearing strata above and potentially impacted strata below the coal seam, and this information is sufficient to meet the requirements of R645-301-724.100. The Division will evaluate additional information as it is received.

Regional Aquifer

The Division has received comments in the past concerning ground water:

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- That there is a regional aquifer;
- That the regional aquifer is not described,
- That there is no information on the discharge area and discharge rates for the regional aquifer; and
- That the Permittee has not established that the saturated zone is not an aquifer.

The July 2000 Environmental Assessment (EA) of the Lila Canyon Project prepared by the BLM labels the “coal formation” of the Blackhawk Formation as a regional aquifer, and mentions springs issuing from the Blackhawk at lower elevations within the canyons. However, the 1985 survey of the Horse Canyon area by JBR and the 1993 - 1995 survey of the area around Lila Canyon by EarthFax did not identify any seeps or springs issuing from strata below the upper Price River Formation (Plate 7-1A).

Utah DWR informed DOGM of an unnamed intermittent drainage at the southwest corner of the Lila Canyon Extension where bighorn ewes and lambs congregate, their presence indicating a water supply. Previously unknown seeps, which flow from near the top of the Mancos Shale, were found in this drainage in 2000. The seeps are located inside the coal lease boundary but just outside the proposed permit area - in Section 26, T. 16 S., R. 14 E. The Permittee initiated monitoring of these seeps (L-16-G and L-17-G) in 2002. The drainage, identified as Stinky Spring Wash on maps in the MRP, is included in the Surface Water Characterizations in Appendix 7-7.

Although these seeps are not a water supply and have limited use, they appear to be an important source of water for Bighorn sheep, specifically in the early spring. Water chemistry is consistent with waters from the Mancos Shale in the Book Cliffs (Section 724.100, Mancos Shale). Plate 7-1 shows these seeps could be related to the Graben Fault, and descriptions in Appendix 7-3 associate these seeps with the graben, although not directly with the fault zones: reference is made to Appendix 7-7 for information on the relationship of the seeps to faulting, but Appendix 7-7 contains no discussion of this subject.

These seeps are at an elevation of approximately 6,000 feet, close to the elevation of the potentiometric surface (Plate 7-1), so the source for the water flowing from these seeps could be connected to the saturated zone that will be intercepted by the proposed mine. In Appendix 7-3, it states, “...being 500 to 600 feet below the coal seam, there is no potential for Lila Canyon Mine to negatively impact this spring or recharge sources.” Because they are below the coal seam, subsidence should not impact these springs. The Permittee further discusses evidence that flow to these springs is most likely through a local system confined to the Central Graben.

Saturated lenticular sandstones of the Blackhawk Formation have been encountered in the Horse Canyon Mine (Section 724.100, Mine Inflow Information). This is typical of conditions found in the Wasatch Plateau and Book Cliffs Coal Fields. The Permittee proposes that formal aquifer names should not be applied to ground-water systems in the permit and adjacent areas; however, the geometry, continuity, and boundary conditions of lithologic units

and potential flow paths suggest that ground-water systems in bedrock groups differ sufficiently for an informal designation based on bedrock lithology. The Permittee designates the Colton, undifferentiated Flagstaff Limestone - North Horn Formation, and Price River Formation as the Upper zone and the Castlegate Sandstone and Blackhawk Formation as the Lower zone, underlain by the Mancos Shale. Ground water occurs in perched aquifers in both zones.

The IPA piezometers were completed within the Sunnyside Sandstone, the basal member of the Blackhawk Formation and the first formation with identifiable water below the coal seam. The sandstone is separated from the coal seams by a mudstone layer, and the water is confined and under pressure. The Permittee expects that this water will not affect mine operations unless the confining mudstone layer is breached. However, the Permittee does expect the mine to intercept saturated zones, similar to what was encountered in the Horse Canyon Mine (Section 724.100, Blackhawk Formation).

Spring and seep inventories identified no springs in the Castlegate Sandstone, situated at the top of the Price River Formation between the Upper and Lower zones, and bore holes did not encounter saturated zones when passing through this stratum. Therefore, the water in the upper ground-water zone is perched and isolated from the lower ground-water zone. This apparently unsaturated zone of separation is most likely results from clay horizons that inhibit downward recharge of ground water from the Flagstaff-North Horn Formation and the limited recharge area exposed on the steep cliff faces of the Price River and Castlegate strata.

Probable Hydrologic Consequences Determination

The PHC is in Appendix 7-3. Hydrologic resources that might be impacted at the Lila Canyon Extension are identified. The springs and stream channels being monitored in the Lila Canyon Extension area are discussed in the MRP. Comments received by the Division in the past expressed concerns that baseline data are inadequate to prepare the PHC and that potential adverse impacts to a regional aquifer and Range Creek have not been addressed in the PHC.

In preparing the PHC, the permittee used information from the Columbia and Horse Canyon Mines along with baseline data collected for the Lila Canyon Extension. Potential adverse impacts identified in the PHC are:

- Contamination from acid- or toxic-forming materials;
- Increased sediment yield from disturbed areas;
- Increased total dissolved solids concentrations;
- Flooding or stream flow alteration;
- Impacts to ground-water or surface-water availability;
- Hydrocarbon contamination from above ground storage tanks or from the use of hydrocarbons in the permit area;
- Contamination of surface and ground water from road salting;
- Contamination of surface water from coal spillage due to hauling operations; and
- Water consumption.

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Section R645-301-728.300 of the Coal Mining Rules requires that the MRP contain specific findings. Most of these have been discussed in previous Technical Memos and the information has been found adequate to meet the requirements of the Coal Mining Rules. Additional information was required on the following:

728.332. Acidity, total suspended and dissolved solids and other important water quality parameters of local impact;

Before being discharged, water will be held in sumps as long as possible to promote settling. Water will be sampled prior to discharge to ensure compliance with UPDES standards.

Surface waters flow only during a limited part of year, and these waters will be protected by sedimentation ponds and other sedimentation control devices. Construction, operation, and reclamation of the Lila Canyon Mine should not change the total load of dissolved and suspended solids entering the system from the Mancos Shale and other sedimentary strata. Nor should it change the volume of solids stored in the alluvium between flow events. Concentrations may vary locally up and down the channels, but the total load that eventually reaches the Colorado River by way of the various tributaries should neither increase nor decrease.

Data indicate mine-discharge water from the Horse Canyon Mine had higher TDS than the receiving stream: TDS concentrations in Horse Canyon Creek measured 1,200 to 1,500 mg/L, and TDS in water discharged into the Horse Canyon Mine from the Blackhawk Formation was 1,400 to 2,400 mg/L. Similar concentrations are anticipated for the Lila Canyon Mine and Right Fork of Lila Canyon. Based on these values, a scenario that would basically double TDS in the stream is conceivable; however, the Permittee states that TDS concentrations in flows in the Right Fork of Lila Canyon can increase by a factor of 1.5. Calcite and dolomite will be used as rock dust in the mine, so the chemistry of the receiving stream should not be altered (Appendix 7-3).

Waters in and around Lila Canyon are class 2B, 3C, and 4 (see R317-2-13). There are no TDS standards for Class 2B and 3C waters. The TDS standard for Class 4 waters (agricultural) is 1,200 mg/l: the Permittee also notes that water with TDS levels of 2,200 to 4,800 mg/L is used for agriculture downstream of the mine. The PHC states that the TDS concentration in discharges from the Lila Canyon Mine to the Right Fork of Lila Canyon will “slightly exceed the agricultural use water-quality standard”. The UPDES permit (Appendix 7-5) allows the mine to discharge up to 2,000 lbs TDS per day but there is no concentration limit.

In the event of an accident that spills coal from the trucks, possible impacts to the surface water are increased total suspended solids and turbidity from fine coal particulates that are washed or blown into the channels (Appendix 7-3, **Coal Haulage**).

The major usable water resources that could potentially be affected in the area are springs that are used by wildlife and livestock. Most of these springs are located upstream of the permit area, or are in areas where subsidence resulting from post-1977 mining is not documented nor

expected from operations in the Lila Canyon Extension. The PHC states that, although pre-mining data are not available for the Horse Canyon Mine, available data (Appendices 7-1 and 7-2) indicate there has been no depletion of quantity or quality of surveyed springs in the Horse Canyon permit area, and none is expected in the Lila Canyon area (Appendix 7-3, Potential for Decreased Spring and Stream Flows).

Flooding from runoff

Runoff from all disturbed areas and several undisturbed areas will flow through the sedimentation pond or other sediment-control device prior to discharge to the Right Fork of Lila Canyon. The sedimentation pond has been designed to be geotechnically stable, minimizing the potential for breaches that could cause downstream flooding. Flow routing through the sedimentation pond and other sediment-control devices will reduce peak flows from the disturbed areas, decreasing the potential for flooding in downstream areas (Appendix 7-4). Both the principal and emergency spillways discharge directly into the bypass culvert.

Undisturbed drainage UA-5 is listed in Table 4 of Appendix 7-4. Table 4 is for undisturbed watersheds that do not report to the sedimentation pond and Table 5 is for undisturbed watersheds that do report to the sedimentation pond.

By retaining sediment on site in the sediment-control devices, the bottom elevations of the Right Fork of Lila Canyon downstream from the disturbed area will not be artificially raised and the hydraulic capacity of the stream channel will not be altered. On the other hand, reducing the amount of sediment can increase the stream's sediment carrying capacity, which can result in stream bank erosion. The outlet of the bypass culvert has been designed to minimize erosion.

The PHC states that reclamation channels have been designed to safely pass the peak flow from a 10-year, 6-hour or 100-year, 6-hour precipitation event, as appropriate. RD-1 and RD-2, respectively the same as DD-11 and DD-12, will remain until Phase 2 bond release (Plate 5-6). Interim sediment-control measures and maintenance of the reclaimed areas during the post-mining period will preclude deposition of significant amounts of sediment downstream.

If subsidence tension cracks reach the surface, they have the potential to locally increase the rate of infiltration into formations overlying the Lila Canyon Mine. The Permittee considers the potential of this happening at Lila Canyon minimal. No hydrologic impacts due to subsidence have been noted at the adjacent Horse Canyon Mine. Also, the shale content of the North Horn, Price River, and the Blackhawk Formations should cause subsidence cracks to heal quickly wherever they become saturated. While the cracks are healing, increased percolation can decrease runoff during the high-flow season because water that normally would have rapidly entered the stream channel might be diverted to the ground-water system. During low-flow periods, increased percolation can result in increased baseflow to streams. The net result will be a decrease in the flooding potential of the affected streams.

There is a potential that flooding of the mine following mining will result in the discharge of water from the portals, but it is unlikely that the ground-water level in the lower ground-water

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zone will ever rise to the level of any portal location for either the Horse Canyon or Lila Canyon Mines. Because the regional geology and hydrologic regimes of the Horse Canyon and Lila Canyon Mines are so similar, the Permittee has extrapolated data from the Horse Canyon Mine to the proposed Lila Canyon Mine.

Mine water is not expected to reach the portal level or flow from the reclaimed portals of either the reclaimed Horse Canyon Mine or the Lila Canyon Mine. Mine water levels measured in 1986 and 1993 indicate that there has been little rise in the water level in the Horse Canyon Mine since mining activities ceased. There is a difference in elevation of about 400 to 500 feet between the lowest portal and the approximate water level in the Horse Canyon mine. The proposed Lila Canyon Mine portals are located up-dip from areas in the mine where water may be expected (Figure 7-1, Volume 7) and there should be no natural discharge of ground water through any of the sealed portals. IPA-1, -2 and -3 indicate the local ground-water gradient is away from the portal areas.

If the water level in a mine rises, the head differential between the discharging aquifer and the mine will decrease, decreasing the inflow rate into the mine. The Lower Sunnyside Coal Seam is underlain by the Sunnyside Sandstone, a marine sheet-sandstone. Porosity and permeability data suggest that if the water level in the mine were to ever approach the level of the portal, the Sunnyside marine sandstone would likely discharge water, preventing any head development behind the portal closures. Much of the Horse Canyon Mine floor has been fractured by the effects of pillar removal, especially near the outcrop, which has probably enhanced the permeability of the underlying Sunnyside Sandstone. The proposed longwall mining in the Lila Canyon Mine is also expected to produce floor fracturing. The resulting increase in permeability would help dissipate head that might develop at the portals. The quantity of water required to reach the portals would need to also be sufficient to saturate a large volume of strata above the mine workings. As a precaution, the Permittee will incorporate standpipes into the grading plans for the portals at the Lila Canyon Mine so that water levels can be checked annually.

The sedimentation pond will have the potential to discharge to the Right Fork of Lila Canyon. Discharge can include water pumped from the mine. The MRP contains a commitment to evaluate morphology parameters and erosion impacts before water is discharged and at least quarterly during pumping to determine what, if any, streamflow alteration is occurring (Section 728.333). Appendix 7-7 includes a characterization of the Right Fork of Lila Canyon that is based on determination of water table elevations in the alluvium and descriptions of biologic communities, and photographs provide a visual record of pre-disturbance conditions. It is expected that downstream impacts from pumping water from the Lila Canyon Mine would be very similar to those experienced in the adjacent Horse Canyon Mine (Appendix 7-3). The results of the evaluation presented in Appendix 7-9 indicate water discharged from the mine is not expected to have a significant impact on the downstream resources, mainly because the flow will be lost due to transmission losses and percolation within 3.4 miles of the discharge point.

Water rights are identified in Section 645-301-727 and Table 7-2. The MRP includes information on water rights in and within one mile of the permit area. The locations of those rights are shown on Plate 7-3. The BLM holds the majority of water rights in the area, and the State of Utah and ranchers claim as many water rights, or more, than UtahAmerican. The Permittee commits to repair or replace any state-appropriated water supply damaged by mining operations (Section 727). The preferable method of replacement will be sealing of surface fractures affecting the water supply, but piping and trucking water are also possibilities. As a last resort the Permittee will replace the water by transferring water rights or constructing wells. Most of the water claimed by UtahAmerican is either from Horse Canyon Creek or underground water from the Horse Canyon Mine, so it is not readily available for replacement of other water supplies in the area, which are mostly springs along Patmos Ridge.

The PHC states that it is unlikely that alternative water supplies will be needed, as contamination, diminution, or interruption of water resources would not likely occur within the mine permit area. Surface waters flow only a limited part of year and will be provided protection by use of sediment controls. The major water resources that could potentially be affected are the springs that are currently used by wildlife and livestock. Most of these springs are located upstream of the permit area or are in areas where subsidence resulting from post-1977 mining is not documented or expected. No known depletion of flow and quality of surveyed springs exists in the Horse Canyon permit area (although pre-mining data are not available) and none is expected in the Lila Canyon area (Appendix 7-3, Potential for Decreased Spring and Stream Flows).

The springs and stream channels being monitored in the Lila Canyon Extension area are discussed in the PHC and current data have been evaluated in determining the PHC. Water monitoring data for the Horse Canyon Mine - Lila Canyon Extension are in Appendices 7-1, 7-2, and 7-6 of the MRP and Appendix VII-1 of the Horse Canyon MRP: more recent data have been submitted directly to the Division's database.

Perched ground-water systems in the Colton and undifferentiated Flagstaff - North Horn Formations are unlikely to be affected because of the thick section of low-permeability rock, rich in plastic clays that can seal fractures, that lies between them and the coal seam. These perched zones are not extensive or interconnected, so if a fracture does drain one, there will be little or no impact on adjacent zones (Appendix 7-3, Potential for Decreased Spring and Stream Flows). These perched zones are also typically outside the areas most likely to be subsided.

L-16-G and L-17-G, in Stinky Spring Wash, issue from the Mancos Shale (Plate 7-1A, Table 7-3). They are outside the permit area, outside the limit of subsidence, separated from the proposed mine workings by a fault, and lie several hundred feet below the coal seam. There is no potential for Lila Canyon Mine to negatively impact these springs or their recharge sources (Appendix 7-3, Potential for Decreased Spring and Stream Flows). At an elevation of approximately 6,000 feet, they are above the water levels measured in the IPA piezometers.

Although some drainages might be intermittent under the definitions in the Coal Mining Rules, flow in the channels of Lila Canyon Wash, Little Park Wash, Right Fork of Lila Canyon,

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and Stinky Spring Wash has been determined to be ephemeral and flow is in response to precipitation runoff or snowmelt. Streams in the Lila Canyon Extension have been monitored since 2000, but no flow has been observed (Section 724.200, Permit Area Surface Water Resources; Section 731.220; Appendix 7-7).

Range Creek is the perennial stream closest to the Horse Canyon Mine – Lila Canyon Extension. Subsidence is projected to remain within the permit boundary, making it improbable that subsidence would affect any part of the Range Creek drainage. Due to the distance of several miles between the proposed permit area and Range Creek, and the roughly 1,000-feet of low permeability strata between the coal seam and Range Creek, Lila Canyon extension does not present any Probable Hydrologic Consequences to Range Creek (Appendix 7-3, Potential for Decreased Spring and Stream Flows; Section 724.200, Permit Area Surface Water Resources).

According to the USFWS, water consumption by underground coal mining operations could adversely modify critical habitat and jeopardize the continued existence of several endangered fish species in the Colorado River basin. The USFWS considers consumption to include evaporation from ventilation, coal preparation, sediment pond evaporation, subsidence on springs, alluvial aquifer abstractions into mines, postmining inflow to workings, coal moisture loss, and direct diversions. Table 2 of Appendix 7-3 includes the following estimates of water consumption:

- Evaporation from Ventilation - evaporation rates, dependent on temperature and relative humidity, has been estimated at 2.5 gallons per million cubic feet of ventilated air. The Permittee projects the ventilation rate at 47,304 million cf/yr of air, so water consumption for evaporation would be approximately 118,300 gallons/year or .363 acre feet/year.
- Coal Preparation – the Permittee does not anticipate any coal preparation that would result in water usage.
- Consumption of 1,260,000 gal/year or 3.86 acre-feet/year in the bathhouse and office.
- Sediment Pond Evaporation - Holding time for water in the sedimentation pond is planned to be short, therefore, no significant evaporation loss is expected.
- Subsidence on Springs - Springs will not be adversely effected by subsidence because either springs are located off the permit area and outside the projected zone of subsidence or are protected by 1,000 feet or more of cover. At the Horse Canyon Mine, there were no reported effects on springs due to subsidence during over 45 years on mining in similar conditions.
- Alluvial Aquifer Abstractions into Mines - There will be no water infiltrations from alluvial systems into the mine.

- Postmining Inflow to Workings - The proposed mine openings for Lila Canyon are at an elevation where no surface inflow is possible. Coupled with the sealing plan for the portals, postmining inflows are virtually impossible.
- Coal Moisture Loss – Coal moisture loss or usage is estimated at 4.5 gallons per ton of coal mined. Based on estimated production of 4 million tons/year, water consumption would be 18 million gal/year (55.2 acre feet).
- Direct Diversions - no consumption.
- Dust suppression - 3,650,000 gal/yr or 11.2 acre-feet/year.

Projected losses total 70.6 acre-feet/year, which is below the USFWS mitigation level of 100 acre-feet/year. The Permittee concludes that due to low hydraulic conductivities (the Permittee gives the Blackhawk average as 3.0×10^{-6} cm/sec in Appendix 7-3 and refers to Table 1 of that appendix for hydraulic conductivity values), ground-water movement, if there is any, is very slow, on the order of centuries to travel a mile. Because of the time it would take for this water to reach the Colorado River drainage were it not consumed during mine operations, it is very unlikely the consumption of this water through mine operations will impact the recovery of the endangered fishes in the Colorado River Basin. Water consumption by the Lila Canyon underground coal mining operation will not jeopardize the existence of or adversely modify the critical habitat of the Colorado River endangered fish species.

The Permittee holds 362.76 acre-feet of underground-water rights to offset consumption. These water rights are in the sealed Horse Canyon Mine; how the Permittee would access this water is not clear, but the Permittee feels it is likely that the proposed Lila Canyon Mine will intercept at least some of this water where new entries pass near old Horse Canyon Mine workings (Appendix 7-3, Mine Inflow Information).

Findings:

The Probable Hydrologic Consequences Determination is not sufficient to meet the requirements of the Coal Mining Rules. Before this amendment is approved, the Permittee needs to provide the following information, in accordance with:

R645-301-624.100, Reference is made in Section 724.100 (p. 19) to Appendix 7-7 for information on the relationship of the Stinky Seeps to faulting, but Appendix 7-7 contains no discussion of this subject. Plate 7-1 shows these seeps could be related to the Graben Fault, and descriptions in Appendix 7-3 associate these seeps with the graben, although not directly with the fault zones. The letter accompanying the submittal states the reference to Appendix 7-7 on page 19 was removed, but this is not so. The Permittee needs to clarify the reference in Section 724.100 (p. 19) or include in Appendix 7-7 information on the relationship of these seeps to faulting.

TECHNICAL MEMO

R645-301-724.100, 748, Section 724.100 states Horse Canyon Well will be refurbished and used during the mining and reclamation activities then sealed and plugged. The current management and condition of Horse Canyon Well are briefly described in supplemental information that accompanied the December 6, 2002 submittal. The letter accompanying this latest submittal states that similar information was added to Section 724.100, but this is not so. The Permittee needs to include information on the present management and condition of Horse Canyon Well in the MRP.

R645-301-731.400, Section 731.400 states, "There are presently no plans to transfer any wells to any other party." The letter accompanying this latest submittal states that text describing the possible future transfer of the Horse Canyon Well to CEU as part of the approved post-mine land use change was added to Sections 724.100 and 731.400, but this is not so. The Permittee needs to update the MRP and clarify the possible future transfer of this well to CEU.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Coal Resource and Geologic Information Maps

Depth to the Sunnyside Seam, the seam to be mined, is shown on the Cover and Structure Map on Plate 6-4. Thickness of the Sunnyside Seam is shown on the Coal Thickness Isopach map on Plate 6-3. Thickness and nature of the Sunnyside Seam, of coal or rider seams above the Sunnyside Seam, and of the stratum immediately below the Sunnyside Seam are shown on the Coal Sections on Plate 6-5.

Plate 6-1 shows surface geology, including coal crop lines, and the strike and dip of the Sunnyside Seam within the proposed permit area. Plate 7-1A shows the geology of a larger area, including the Range Creek drainage, along with location of surface- and ground-water monitoring points in and adjacent to the Horse Canyon and Lila Canyon permit area. The cross section on Figure 7-1 (Volume 7) shows the rock tunnels, the dip of the strata, stratigraphy, and expected ground-water elevation. Plate 7-1B shows the geologic cross-section extending from Lila Canyon to Range Creek, including a projection of the water level indicated in the IPA piezometers. Figures VI-1 and VI-2 portray the general stratigraphy of the permit and adjacent areas.

Elevation contours on the Sunnyside Seam as determined from the outcrop and bore holes are on Plates 6-2 and 6-4. The plates indicate that the coal seam crops out at approximately 6,500 feet in the vicinity of the rock-slope tunnels. The tunnels will intercept the

coal seam at approximately 6,300 feet (Figure 7-1, Volume 7). Plate 6-3 shows coal thickness isopachs.

Depth of cover ranges from 1,500 to 2,300 feet according to Section 525.120. Dirt roads are in areas with over 1,000 feet of cover or in area that will not be subsided. Part of Little Park Wash has less than 1,000 feet of cover. Plate 5-5 shows it is less than 1,500 feet over a large part of the mine, which agrees with statements in Sections 6.4.2 and 6.5.3.2. In places where the planned workings are near the escarpment, Plate 5-5 shows cover thickness is on the order of 500 feet. Deeper coal is generally to the east and north (Section 6.5.3.2.)

Fault locations and offsets are shown on Plate 6-1 and discussed in the text. Fault traces are not always visible at the surface, and fault locations on Plates 6-1 and 6-2 are also based on exposures at the outcrop, faults encountered in the Geneva Mine, and information from drilling (Section 6.5.3.3). Interpretations of fault alignments, which are based on detailed mapping by Kaiser Corporation consultants, differ slightly from those on maps published by the others (Section 6.4.2), including the USGS. Aside from differences in detail, these sources agree on general location, extent, and magnitude of the faults.

The Sunnyside Fault, shown on Plates 6-1 and 6-2 of the Lila Canyon MRP and Plate II-2 of the current MRP, limited mining to the east in the Horse Canyon Mine. The Permittee believes it lies east of the proposed Lila Canyon Extension (Section 6.5.3.3). On Plates 6-1 and 6-2, the MRP indicates the Sunnyside Fault dies out near the northeast corner of the Lila Canyon Extension.

Most maps and cross sections in the MRP extend as far as Patmos Ridge but include only a small portion of the Range Creek drainage. Geologic maps and cross sections that extend from the Book Cliffs to the Range Creek drainage have been added to the MRP.

Subsurface Water Resource Maps

Many maps and cross sections in the MRP include only a small portion of the Range Creek drainage, which covers a large area east of the Horse Canyon Mine and Lila Canyon Extension. Geologic maps and cross sections that extend from the Book Cliffs to Range Creek have been added to the Lila Canyon Extension MRP (Plates 7-1A and 7-1B).

Water-level elevation contours are on Plate 7-1. Water levels for the IPA piezometers are tabulated in Appendix 7-1. The data do not evidence seasonal variations. The Permittee has portrayed variations of head on a contour map in Figure 7-1 (Volume 6) and shown them graphically in Figure 7-2.

The MDC Well in NW Section 9 of T. 16 S., R. 14 E., near the road junction, is listed in Table 7-2 - Water Rights. The Horse Canyon Well is located nearer the Horse Canyon Mine surface facilities. These wells were installed in a small alluvial aquifer at the mouth of Horse Canyon. They are discussed in Section 724.100, Wells and shown on Plate 7-1.

TECHNICAL MEMO

The ground-water elevation in the Horse Canyon Mine, at the rotary car dump at the intersection of the Main slope and 3rd level, is described in Section 724.100, Mine Inflow Information. The elevation was approximately 5,800 feet in 1986. This projected ground-water elevation was used in projecting where mining will intercept water, but not in mapping the approximate piezometric surface on Plate 7-1. The location of the dump is described in the text and is shown on Plate 7-1. Underground exploration work performed by BXG in 1993 found water in the Horse Canyon Mine at approximately 5,870 feet. The location for the measurement is on Plate 7-1. The potentiometric surface on Plate 7-1 is closely congruent to the 1993 BXG measurement in the Horse Canyon Mine, although this point does not appear to have been used in projecting that surface. The MRP states that the level measured by BXG is probably representative of water level in the rest of the Horse Canyon Mine.

Water rights are listed in Table 7-2. The list includes Redden Spring, plus springs identified as Mont, Leslie, Cottonwood, Williams, Kenna, and two Pine springs (Kenna Spring is in the Range Creek drainage.) In addition, there are eleven unnamed springs listed, plus the MDC well and three rights associated with underground tunnels of the Horse Canyon Mine. Locations are on Plate 7-3. Surface and subsurface water rights for nearby portions of the Range Creek drainage are listed in Table 7-2 and shown on Plate 7-3.

Findings:

Maps, Plans, and Cross Sections of Resource Information are sufficient to meet the requirements of the Coal Mining Rules.

OPERATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

General

The Permittee has based the ground-water and surface-water monitoring plans on the PHC determination and the analysis of baseline hydrologic, geologic, and other information in the proposed amendment (Sections 731.211 and 731.221). The surface- and ground-water monitoring sites will be monitored quarterly through the operational and reclamation periods to document any diminution or damage to the hydrologic balance. Water samples from seeps,

springs, and streams will be analyzed for the parameters listed in Tables 7-4 and 7-5. The parameters in Tables 7-4 and 7-5 match the operational parameters in the Division's Directive Tech 004. Monitoring reports will be submitted to the Division at least every three months, within 30 days following the end of each quarter (Section 731.220).

The proposed Lila Canyon Extension includes a commitment to analyze ground- and surface-water samples for baseline parameters preceding each 5-year permit renewal. These permit-renewal baseline analyses will be done for the surface-water samples collected at either high or low flow and for the spring samples collected at low flow during that year (Section 731.200).

The Permittee's water-monitoring plan is intended to provide data to show impacts to potentially affected springs, seeps, impoundments and drainages within and adjacent to the permit area by comparison with relevant baseline data and with applicable effluent limitations. The Permittee has selected monitoring locations and frequencies, described in Table 7-3, so that significant springs, seeps, impoundments and drainages that could potentially be impacted by the mining and reclamation operations will be monitored on a regular basis (Sections 731.222 and 731.222.2).

Groundwater Monitoring

Section 731.211 discusses the ground-water monitoring plan. It makes reference to water rights on several of the springs to be monitored. Section 731.212 states that when analyses of ground water indicate non-compliance with permit conditions, the operator will promptly notify the Division and take the actions provided for in (R645-300-)145 and (R645-301-)731. No springs or seeps (as identified in the 1986 JBR study) are located within the disturbed area or near the proposed surface facilities (section 724.100, Spring and Seep Data).

The Division has received comments that the number of seeps and springs being monitored is not sufficient, most of them are outside the permit, and one spring in the permit area is not sufficient. Determination of the permit area is not based on hydrologic systems. The Coal Mining Rules require protection of resources both inside and outside the permit area, and baseline and operational monitoring of both the permit area and adjacent areas. The Division notes that expanding the permit area to include more springs would actually lower the performance standard for protection of the added springs from; "minimize impact" and "prevent material damage", to simply "minimize impact".

The seeps and springs selected by the Permittee for monitoring are representative of the springs and seeps in the ground-water emergence zones located over or adjacent to the area of proposed mining. Additional, detailed investigation of every aspect of every component of the hydrologic resources is not needed to monitor the resources and minimize impacts, or to comply with the Coal Mining Rules. Springs initially selected typically have baseline water-quantity and -quality data from the EarthFax survey, have been developed for use by the water right holder, and have the greatest or most consistent flow of the group or zone.

TECHNICAL MEMO

To establish a continuous record from pre-mining into operational conditions, ground-water monitoring for the Lila Canyon extension began at locations L-6-G through L-10-G in 2000. As the mine plan has developed, springs have been added or removed to optimize the effectiveness of monitoring. L-11-G and L-12-G were added in October 2001 to replace L-6-G and L-10-G, which were dropped in 2003. L-11-G has more consistent flows than the nearby L-6-G, and the Permittee considered L-10-G to be too far outside the permit area to be of any benefit. Seeps in Stinky Spring Canyon at the southwest corner of the Lila Canyon Extension area were added to the monitoring plan in 2002 (L-16-G and L-17-G).

There are 11 sites proposed for operational ground-water monitoring: L-5-G, L-7-G, L-8-G, L-9-G, L-11-G, L-12-G, L-16-G, L-17-G and IPA-1, -2, and -3. These are described in Section 731.211 and listed in Table 7-3. Locations are shown on Plate 7-4. Data collected up through October 2002 are in Appendix 7-1. More recent data have been submitted directly to the Division's database. Station L-5-G is the potential mine discharge point and will be monitored in accordance with UPDES Permit requirements. IPA-1, -2, and -3 will be monitored quarterly for water levels (Section 731.211).

The MRP states there are 13 ground-water monitoring sites proposed for the Lila Canyon Extension (Section 731.211, p. 38), but that number includes abandoned monitoring sites L-6-G and L-10-G. This is a minor point but it is often this type of discrepancy that causes confusion and possible hold-ups when the public reviews the plan. The Permittee needs to update page 38 to indicate that 11 ground-water sites are to be monitored under the proposed plan for the Lila Canyon Extension or clarify that the 13 sites include 2 that are no longer monitored.

L-7-G, L-8-G, L-9-G (Pine Spring), and L-10-G (William's Draw Spring) correspond with the springs monitored by EarthFax as 9, 10, 16(Z), and 14, respectively. L-12-G corresponds roughly with EarthFax springs 11 and 12, but does not coincide exactly with either one. Appendices 7-1 and 7-6 of the Lila Canyon Significant Revision contain water-quality data on springs 9, 10, 14, and 16(Z) from 1993, 1994, and 1995, when they were monitored for baseline for the South Lease by IPA. There are field data on springs 11 and 12 but no water-quality analyses were done.

L-6-G (H-18) is downgradient from water rights 91-617 (Mont Spring) and 91-618 (Leslie Spring). These water rights correspond closely to JBR sites H-21 and H-19 and are near H-20, H-21A, H-21B, and H-22. The Permittee selected H-18 as the location for L-6-G because it is the lowest spring in the group; however, this location has been dry during recent monitoring, so L-11-G, located approximately 100 yards up the drainage, has been added to replace L-6-G. Spring L-11-G corresponds with sites H-18A and H-18B. There are no data in the MRP on H-18A and H-18B, but from Plate 7-1, these appear to be in the same alluvial system that was monitored at L-6-G.

Spring L-7-G, monitored as spring 9 (or S-9) from 1993 to 1995, is near springs 8, 19-A, and 19-B (Plate 7-1) and has had consistent flow. Baseline data for these springs are in Appendices 7-1 and 7-6. Spring 9, or more likely this group of springs, has also been called Cottonwood Spring (Section 731.211), which is associated with water right 91-2521 in Table 7-

2. However, Plates 7-1 and 7-3 indicate water rights 91-399 and 91-2537 are located in this group of springs, while water right 91-2521 is located on an adjacent topographic high (NE/4 Sec. 13, T. 16 S., R. 14 E.).

A water-monitoring program was implemented in 2000 to determine if the springs proposed for operational monitoring were still viable and to establish a current baseline that would be continuous with operational monitoring. Additional sites were added in 2001 and 2002. Data collected through October 2002 are in Appendix 7-1, and the most recent data are in the Division's database.

Baseline water levels for 1994, 1995, and 1996 have been established at three points: IPA-1, IPA2, and IPA3. In December 2000, the Permittee was able to measure the water level in IPA-2, but at IPA-1 and IPA-3 the probe was not able to go far enough into the piezometers to reach water (Section 731.513). Water monitoring reports indicate the piezometers were not accessible in February 2001. The Permittee successfully measured water levels in all three piezometers on May 15, 2001 and each quarter since. Data collected through October 2002 are in Appendix 7-1, and the most recent data are in the Division's database.

Map 7-1, based on data from several sources, shows potential ground-water levels and where the Permittee anticipates the mine workings might intercept ground water. If mine water interception occurs, the water will be stored in sumps and used in the mine and, if necessary, discharged from the mine. Eventually, the mine may intercept the three IPA piezometers: in addition to the three piezometers, the Permittee commits in to the monitoring of underground usage and discharge to more accurately define potential impacts on ground water (Section 731.513).

Ground water will be monitored and data will be submitted at least every three months for each monitoring location. Monitoring submittals will include analytical results from each sample taken during the approved reporting period. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, then the operator will promptly notify the Division and immediately take the actions provided for in 145 and 731 (Section 731.212). Ground-water monitoring will continue through mining and reclamation until it is no longer necessary (as determined under R645-301-731.214.1 and -731.214.2) or until bond release; in-mine monitoring will cease when sites are no longer accessible (Section 731.214).

Equipment, structures and other devices used in conjunction with monitoring the quality of ground water on-site and off-site will be properly installed, maintained and operated and will be removed by the operator and when no longer needed (Section 731.215).

Contamination of perched ground water in the Price River and Colton Formations is unlikely because the perched zones are several hundred feet above the Lower Sunnyside Coal Seam, and low-permeability strata separate the perched ground-water zones from the coal seam. The perched ground water will not be intercepted by mining activities

TECHNICAL MEMO

Acid- and Toxic-Forming Materials and Underground Development Waste

Two rock slopes driven upward from the base of the Book Cliffs to the coal seam will provide access to the underground workings of the Lila Canyon Mine. Rock that will be removed from the tunnels is designated as “rock-slope material” or “mine development waste” and it fits into the classification of underground development waste. Rock-slope material / mine-development waste will contain mostly shale, sandstone, and mudstone. Traces of coal may be found (Section 520, Rock Slopes). Rock-slope material/ mine development waste will be used to fill in some low areas (Section 537.200), referring to the shop-warehouse concrete pad that will extend onto the rock-slope structural-fill portion of the refuse pile (Section 528.320; Plate 5-2).

(Sections 537.200 through 537.250 have been omitted from pages 54 and 55 of the latest submittal.)

The refuse pile has been designed as a location for the storage and disposal of coal processing waste and underground development waste that is brought to the surface, including any excess slope-rock material or underground development waste not used as fill (Sections 520 and 528.320); it is not anticipated by the Permittee that any underground waste other than the slope-rock will be brought to the surface (Section 536). Coal processing waste from the crusher will be placed in the refuse pile (Section 528.321); however, this will not be in the portion to be used for disposal of slope-rock material and used as a pad for the mine buildings. The areas in the refuse pile for rock-slope fill and for coal-mine waste are adjacent and adjoining and will be treated as one area or (Section 528.320; Plate 5). The designed capacity of the pile is 44,400 yd³, which is in excess of projected needs (Appendix 5-7; Section 520, Refuse Pile). Appendix 5-7 provides more detailed information on construction, operation, and reclamation of the refuse pile.

Material not transported to the surface, such as overcast material, rock falls, and slope material may be disposed of underground according to the appropriate MSHA regulations (Section 513.300). Because this will be an underground mine there will be no spoil.

The Permittee has committed that the underground development waste to be placed in the refuse pile will be examined and tested as necessary to determine acid- and toxic-forming potential (Sections 536 and 731.311). According to Appendix 5-7 - Refuse Testing, samples will be collected and analyzed a minimum of five times during construction of the rock-slope tunnels, and from every 6,000 tons of waste rock placed on the refuse pile during mine operation; the parameters to be determined are in Table 2.

The Lila Canyon Extension reclamation plan specifies 4 feet of subsoil and topsoil will be placed over the refuse pile. This includes the slope-rock underground development waste used to build the pads that will be included in the refuse disposal area for final reclamation and buried with 4 feet of subsoil and topsoil (Section 553.300; Section 731.311; Appendix 5-7). Noncoal waste generated during reclamation, such as concrete, culverts, utility lines, septic

systems, will be buried in the refuse disposal area with a minimum of four feet of cover (Section 542.741). Asphalt will not be placed in the refuse pile (Section 542.640)

Some statements in the MRP could be more precise. The overall plan for handling, storage and disposal of coal mine waste and reclamation of one, unique refuse pile is sufficiently clear and meets the requirements of the Coal Mining Rules.

Diversions: General

Ditches and culverts that carry runoff from disturbed and undisturbed areas are shown on Plate 7-2. Appendix 7-4 contains design calculations for the diversions.

Diversions: Perennial and Intermittent Streams

All flows in the permit area are miscellaneous flows (Section 742.330). Temporary diversions are designed to safely pass the peak runoff of a 2-year, 6-hour precipitation event. Design details are in Appendix 7-4 (Section 742.33). Appendix 7-4 states all ditches are designed to carry the expected runoff from a 10-year, 6-hour event with a minimum freeboard of 0.5 ft. All culverts are designed to handle the expected runoff from a 100-year, 6-hour storm event (Appendix 7-4). Designs in Appendix 7-4 are therefore more robust than indicated in Section 742.333 and meet the requirements of the Coal Mining Rules.

Findings:

Hydrologic Information is not sufficient to meet the requirements of the Coal Mining Rules. Before this amendment is approved, the Permittee needs to provide the following information, in accordance with:

R645-301-742.333, The Permittee needs to clarify what precipitation events are used in the designing of diversions. Section 742.333 states peak runoff of a 2-year – 6-hour precipitation event as used; designs in Appendix 7-4 are based on a 10-yr, 6-hr event. The designs in Appendix 7-4 are therefore more robust than indicated in Section 742.333, but the discrepancy in the text in Section 742.333 (and anywhere else in the MRP a similar statement appears) needs to be corrected. The letter accompanying the current submittal states Section 742.333 was changed to address this, but this is not so.

R645-301-731.200, The MRP states (Section 731.211, p. 38) that there are 13 ground-water monitoring sites proposed for the Lila Canyon Extension, but that number includes sites L-6-G and L-10-G, which were abandoned in 2003. There are currently only 11 sites proposed for operational monitoring (Table 7-3). This is a minor point but it is often this type of discrepancy that causes confusion and possible hold-ups when the public reviews the plan. The letter accompanying the current submittal states the reference in Section 731.211 was changed to reflect 11 sites for operational monitoring, but this is not so. The Permittee needs to update

TECHNICAL MEMO

Section 731.211 to indicate that 11 ground-water sites are to be monitored under the proposed plan for the Lila Canyon Extension or clarify that the 13 sites include 2 that are no longer monitored.

R645-301-121.200, The Permittee needs to

- Restore Sections 537.200 through 537.250 (pp. 54 and 55) to the submittal;
- Remove the extraneous text (underlined below) inserted into the first sentence of Section 731.521 - Portal Location.

The proposed access portals are below the characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material. coal outcrop, as shown on Figure 7-1, Plates 5-5 and 7-5.

RECLAMATION PLAN

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

The Permittee states that the Horse Canyon Well, located near the main Horse Canyon surface facilities, well will be refurbished and used during the mining and reclamation activities then sealed and plugged (724.100 Ground Water Information, Wells). As part of the post-mining land use change approved by the Division on January 6, 2004, the Horse Canyon Well is to be transferred to CEU as a potential source of culinary water for the Utah universities science field camp. According to R645-301-731.400, the Permittee retains responsibility for proper management of this well until bond release. If the Horse Canyon well is transferred to CEU, the Permittee will no longer be involved in maintenance or operation. If the transfer to CEU has not occurred at the time of the Permittee's application for final bond release, the Division will need to determine if there is reasonable likelihood this alternative post-mining land use will be accomplished; if not, the requirements of final reclamation will need to be met, which will include sealing of this well.

Section 731.400 states, "There are presently no plans to transfer any wells to any other party." The letter accompanying this latest submittal states that text describing the possible future transfer of this well to CEU as part of the approved post-mine land use change was added to Sections 724.100 and 731.400, but this is not so. The Permittee needs to update the MRP and clarify the possible future transfer of this well to CEU.

The MDC Well has - to the best of the Permittee's knowledge - been sealed (Section 724.100).

When piezometers IPA-1, IPA-2, and IPA-3 are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations (Section 731 .400).

Findings:

Reclamation Information on wells and piezometers is not adequate to meet the requirements of the Coal Mining Rules.

(repeat) R645-301-731.400, Section 731.400 states, "There are presently no plans to transfer any wells to any other party." The letter accompanying this latest submittal states that text describing the possible future transfer of this well to CEU as part of the approved post-mine land use change was added to Sections 724.100 and 731.400, but this is not so. The Permittee needs to update the MRP and clarify the possible future transfer of this well to CEU.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

The CHIA for this submittal has not been prepared yet. The Division has received comments in the past that there are insufficient data to prepare a CHIA for the Horse Canyon Mine – Lila Canyon Extension area. Data are available from federal, state, and a number of sources. The Permittee is not required to provide data unless none is available from other sources. The Division is not limited to information in the MRP in preparing the CHIA; however, it is anticipated that data in the MRP will undoubtedly be used along with other information in preparation of the CHIA.

The Division has received comments in the past that the discharge area for the regional aquifer is not identified. The potential for discharge from a regional aquifer will be considered in the CHIA.

The Division will provide an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation, and all anticipated mining, upon surface- and ground-water systems in the cumulative impact area. The CHIA will be sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The Division will use data and analyses from several sources, including those submitted by the Permittee in the Lila Canyon Extension MRP.

TECHNICAL MEMO

Findings:

The CHIA for this submittal has not been completed yet.

RECOMMENDATIONS:

This amendment should not be approved for inclusion in the MRP until the deficiencies identified in this TA have been adequately addressed.

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